

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U.S. Department of Energy

National Energy Technology Laboratory

**Support of Advanced Fossil Resource Conversion and Utilization
Research by Historically Black Colleges and Universities and
Other Minority Institutions**

Funding Opportunity Number: DE-PS26-07NT43114

**Announcement Initial
Type:**

CFDA Number: 81.089

Issue Date: 04/13/2007

Application Due Date: 06/12/2007 at 8:00:00 PM Eastern Time

This announcement will remain open until the Application Due Date. Applications may be submitted any time before the announcement closes.

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit: Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See www.grants.gov/GetStarted. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the U.S. Department of Energy.

Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

- Number 1 - Grants.gov Submission Receipt Number
- Number 2 - Grants.gov Submission Validation Receipt for Application Number
- Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 - DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

- Number 5 - DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

1. BACKGROUND

The program was designed to raise the overall level of competitiveness of Historically Black Colleges and Universities and Other Minority Institutions HBCU/OMIs) with other institutions in the field of fossil energy research; and to tap an under-utilized resource by increasing the number of opportunities in the area of science, engineering, and technical management for HBCU/OMI.

2. STATUTORY AUTHORITY

Program is provided by Public Law 95-224, as amended by 97-258.

3. PURPOSE AND OBJECTIVE

This document presents the Department of Energy, National Energy Technology Laboratory's (DOE/NETL's) strategy for evaluating and selecting applications in response to Funding Opportunity Announcement Number DE-PS26-07NT43114 entitled, "Support of Advanced Fossil Resource Conversion and Utilization Research by Historically Black Colleges and Universities and Other Minority Institutions."

Grants awarded under this program are intended to maintain and upgrade educational, training, and research capabilities of our HBCUs/OMIs in the fields of science and technology related to fossil energy resources. Project results will be used to further DOE's commitment to Fossil Energy research. In addition, a public purpose is achieved by tapping into an under-utilized human resource pool existing in the form of HBCUs/OMIs. The involvement of professors and students from the HBCU/OMI and the commercial sector in the development and execution of fresh new research ideas, and the establishment of linkages between the HBCU/OMI and private sector fossil energy community are essential to the success of this program. Therefore, HBCU/OMI faculty members and their institutions are strongly encouraged to undertake fossil energy-related research and development projects; however, collaboration with the private sector is encouraged, but not required.

4. TECHNICAL FOCUS AREAS

This funding opportunity announcement contains multiple program areas of interest identified in the funding opportunity description. Applicants are cautioned that this funding opportunity announcement is a master announcement and that each technical topic area of interest has three subtopics and each subtopic has its own program-specific number for submission of applications. For example, Subtopic 1A, Robust Sensor Networks for Intelligent Control of Advanced Coal Combustion/Gasification Processes, under TECHNICAL TOPIC 1, SENSORS AND CONTROLS, has a funding opportunity number of DE-PS26-07NT43114-01A. Applications cannot be submitted under the master announcement. Please carefully read the description of program areas given below and submit your application under an appropriate funding opportunity number that best describes

your application. Submission under an inappropriate subtopic may result in rejection or lower rating of your application.

You may submit more than one application. Each application must have its own unique title on the subject line (i.e., project title and principal investigator/project director, if any).

Fossil fuels (coal, oil, and gas) provide 85 percent of our energy in the United States. These fuels are a key ingredient for our domestic economic growth and international competitiveness. While the energy industry is undergoing fundamental changes due to deregulation, environmental concerns, and other factors, there are discernible trends for a vision of future economy where electric energy, clean liquid fuels, natural gas, hydrogen, and manufacturing will be closely intertwined in a highly efficient, flexible economic system.

To broaden fossil resource and technology benefits to our commerce and consumers, the Department of Energy Office of Fossil Energy (DOE-FE) has initiated programs to enhance scientific and technical understanding of the processes involved in the conversion and utilization of fossil fuels. In view of recent spikes in oil prices, there appears to be a renewed interest in unconventional fuel resources such as oil shale and tar sands. Technologies that are currently managed by Fossil Energy include the following: Natural Gas Supply and Delivery Reliability, Oil Exploration and Production, Petroleum Fuels and Environmental Solutions, Gasification, Combustion, Distributed Generation, Advanced Research and Power System including Vision21, and FutureGen, Hydrogen, Syngas, Sequestration, and Advanced Turbines. The integrated program path leading to Advanced Power System also includes large-scale demonstration (Clean Coal Power Initiative) to establish a foundation for the next generation of technologies.

In order to develop and sustain a national program of university research in advanced technologies and fundamental fossil fuels studies, the DOE-FE is interested in providing assistance to develop and maintain a broad-based research infrastructure to provide educational and research training opportunities for tomorrow's scientists and engineers.

Grant applications are sought in innovative research and development of advanced concepts pertinent to fossil fuel conversion and utilization under the following three technical topics. The topics are further divided into three subtopics with unique funding opportunity number and are elaborated in this section:

TECHNICAL TOPIC 1 – SENSORS & CONTROLS

TECHNICAL TOPIC 2 – COMPUTATIONAL ENERGY SCIENCES

TECHNICAL TOPIC 3 – ADVANCED MATERIALS

TECHNICAL TOPIC 1 – SENSORS & CONTROLS

Subtopic 1A. Robust Sensor Networks for Intelligent Control of Advanced Coal Combustion/Gasification Processes (DE-PS26-07NT43114-01A)

Significant technological advances have been made towards the development of near zero emission power plants based on advanced coal gasification and combustion processes. In an effort to meet the efficiency, environmental performance, and cost goals of these advanced power generation systems, work is being initiated on the development of intelligent control strategies that provide system integration, optimization, and prognostic health control capabilities in addition to basic process control. Control system development is viewed as an important enabling technology for the commercial deployment of these systems.

A critical component of the process control system is the input from instrumentation and monitoring systems. With the evolution of new sensors, embedded intelligence capabilities, and communication

platforms, opportunities exist for the development and design of robust intelligent sensor networks that enable the application of advanced control methodologies. Grant applications are requested to develop sensor networks that include one or more of the following:

- Enable the use of advanced control methodologies.
- Consider the use of harsh environment physical and chemical sensor as well as those that operate at more benign conditions to provide a real time diagnostic suite.
- Integrate new sensor technologies with “smart” sensing capabilities.
- Consider wireless sensor networks in areas of condition monitoring and system optimization.
- Incorporate standardized communication platforms to minimize cost and increase industry acceptance.
- Examine new approaches to regulatory emission monitoring.

Within select sensor networks for emerging high efficiency turbine and fuel cell power systems, there are measurement needs that are currently unmet. Future power systems will likely use coal derived synthesis gas as preferred domestic fuel. Since this fuel is generated from coal, the constituents could vary widely and impact the operation of these systems. In order to protect and manage the operation of these systems with advanced control techniques, the need for an online gas quality measurement has been identified. While traditional analytical techniques can provide accurate analysis of gases, their response time and accuracy are not sufficient for the emerging power systems. New approaches are requested to rapidly detect and quantify individual gas constituents commonly found in synthesis gas (See Table 1). Response times of 1 second or shorter are targeted. Measurements showing the total BTU content of the gas mixture is not desirable. The ratio of certain gas constituents, contaminant levels, as well as detection of atypical gas constituents are important parameters that would allow operators to promptly react to and control the operation of these advanced power systems. The development of this measurement technique in combination sensor network described above is of interest under this subtopic.

In fuels such as coal-derived synthesis gas, the hydrogen content is higher, whereas it is almost nonexistent in natural gas. Advanced turbine machinery will be adapted to utilize coal derived high hydrogen fuels but will also be presented with challenges that will need to be managed, in part, by advanced control and monitoring systems. One of the primary challenges of interest is to manage and control flame instabilities and flashback that occur with premixed ultra-low NO_x combustion systems. Fuels with high hydrogen content, such as coal-derived synthesis gas, will be more problematic in dealing with the practical aspects of flashback and instability issues due to 1) the higher flame speed of hydrogen, 2) the broader flammability limits and 3) the lower energy content on a volume basis compared to methane. Developing an understanding and an approach to monitor and control this phenomenon in turbines that utilize high hydrogen fuels is within the purview of this subtopic.

Table 1: Typical gas compositions for coal derived synthesis gas
(Natural Gas is listed for comparison purposes.)

Component	Natural Gas - Typical (mole % range)	Coal Derived Synthesis Gas (mole % range)
Methane	87.0 - 96.0	0-4.6
Ethane	1.8 - 5.1	0-0.2
Ethene	0-0.1	
Propane	0.1 - 1.5	
Isobutane	0.01 - 0.3	
Butane	0.01 - 0.3	
Isopentane	trace - 0.14	
Pentane	trace - 0.04	

Hexanes plus trace - 0.06 -
Nitrogen 1.3 - 5.6 0.1-4.1
Argon - trace-1.1
Oxygen 0.01 - 0.1 -
Hydrogen trace - 0.02 16.1-33.9
Carbon Dioxide 0.1 - 1.0 1.5-15.5
Carbon Monoxide - 5.8-63.1
Carbonyl Sulfide - trace-0.1
Hydrogen Sulfide - 0.2-1.3
Water - 2-61.8
Ammonia and Hydrogen Cyanide - 0-0.3

Source: <http://www.uniongas.com/aboutus/aboutng/composition.asp> Chapter 8, Seventh Edition
Fuel Cell Handbook, page 21, www.netl.doe.gov

Subtopic 1B. Novel Sensors for Deep Resources (DOE's Deep Trek Program) (DE-PS26-07NT43114-01B)

To date, less than 1 percent of all wells drilled in the U.S. have penetrated below 15,000 feet, yet their production accounts for nearly 7 percent of the domestic production, and is expected to grow to 12% by 2010 (NPC, 2003). Development of deep reservoirs is currently restricted to only the most promising prospects. The primary barrier limiting recovery from deep formations is that drilling systems cannot withstand the extreme conditions encountered when drilling deep, resulting in an exponential increase in drilling costs (as much as 50% of drilling cost is encountered in the last 10% of the well). The limits of conventional drilling and well construction technology are often exceeded when drilling wells to 20,000 feet. Extremely high temperatures (>400°F), exceptionally high pressures (>15,000 psi), exceedingly hard rock, and highly corrosive gases all combine to create a very hostile environment for well drilling and completion.

DOE's Deep Trek program (<http://www.fossil.energy.gov/programs/oilgas/drilling/index.html>) was initiated in 2001 with a goal of developing an integrated deep drilling and deep imaging system that will enable industry to economically recover an additional 100 Tcf of natural gas through 2020. Several projects and technologies have been funded over the past five years, but additional needs remain to be addressed.

The objective of this subtopic is to develop novel sensor systems that include but are not limited to the determination of pressure, position, temperature and flow. These sensors shall fit under DOE's Deep Trek Program, which focuses on developing advanced technologies that will operate in very deep (>20,000 feet) high temperature (>400 F), high pressure (>15,000 psi), hard rock, corrosive environments. The proposed technologies shall be compatible with, and complement, currently applied or emerging technologies developed under DOE's drilling programs or other industry programs to allow for integrated demonstrations.

Subtopic 1C. Air Emission Sensors, Controls, and Modeling for Oil and Gas Resources (DE-PS26-07NT43114-01C)

Background: The goal of DOE is to provide solutions to environmental issues that are limiting domestic on-shore or off-shore exploration and production while providing the same or higher levels of environmental protection. DOE has identified air quality issues as an areas that posed significant barriers for both oil and gas producers across the country. The air quality issues are limiting domestic production by restricting additional development or by adding costs that cause operators to abandon existing wells while substantial recoverable resources remain in the ground.

Applications should describe as completely as possible the impact that the project will have on

increasing or maintaining domestic production either nationally or from an identified region. The description of the production impact should discuss in detail the resource affected and the amount of domestic production that can be added or maintained as a result of the successful completion of the project.

Air Emission Sensors and Control: Applications are sought to provide better tools to meet existing or pending air emission requirements for oil and gas exploration and production. Applications should address development of new technologies or the innovative application of existing technologies. Applications should address controls or sensors that provide measurements of emissions levels or feedback controls that adjust engine performance to reduce emissions. The technologies proposed should be applicable to oil-field related engines such as compressor engines. Applications should specifically address the capability of the proposed technology to operate effectively in a variety of temperature regimes and in remote areas with minimal operator monitoring or adjustment. Projects should be aimed at reducing the cost of meeting existing requirements or providing lower-cost technologies to meet proposed requirements. Applications addressing proposed requirements should demonstrate that the proposed requirement is likely to be implemented in the near future.

Air Emissions Modeling: Applications are sought to develop improved air models that will provide a more accurate assessment of the impacts of oil and gas activities on regional air quality i.e. from surface emissions from drilling equipment or compressor stations or storage areas. The models proposed should address emissions such as SO₂, NO_x, VOCs, and particulates that affect visibility as well as particulate precursors. Applications should demonstrate that the proposed model is likely to be accepted and implemented by the appropriate regulatory agencies such as the U.S. Environmental Protection Agency and/or State air quality regulators.

TECHNICAL TOPIC 2 – COMPUTATIONAL ENERGY SCIENCES

Subtopic 2A. Multiphase Flow Simulation (DE-PS26-07NT43114-02A)

[For background information on this subtopic, please see “Report on Workshop on Multiphase Flow Research, Morgantown, WV, June 6-7, 2006,” ed. M. Syamlal, DOE/NETL-2007/1259, December 2006, http://www.netl.doe.gov/events/06conferences/mfr_workshop/Multiphase%20Workshop%20Report%206.pdf]

Polydispersed Systems: Proposals are sought for developing continuum models of gas-solids flows that describe suspended solids with a distribution in size or density or both. The constitutive models are required for granular stresses and gas-solids drag. The granular stress models are expected to be extensions of granular kinetic theory applicable to several discrete particle types or to a particle size/density distribution. Research work may be proposed in areas such as the development of theory and advanced computational models, gathering of experimental data from physical systems or molecular dynamics simulations, and the validation of the models.

Frictional Flow Regime: Proposals are sought for the development of continuum models of gas-solids flows applicable to flow regimes in which the particles are in enduring contact. Although constitutive models originating from soil mechanics are available for describing dense flows, these models cannot handle the transitions from stagnant to shearing regimes and from dense flow to dilute flow (described using granular kinetic theory) regimes. Research work may be proposed in areas such as the development of theory and advanced computational models, the gathering of experimental data from physical systems or molecular dynamics simulations, and the validation of the models.

Subtopic 2B. Advanced Diagnostics For Gas Solids Flow Systems (DE-PS26-07NT43114-02B)

Advanced diagnostics are needed for probing the fluid dynamics of solids and gas solids flow systems. Detailed information on solids and gas-solids flow structure is needed for validation of

computational fluid dynamic (CFD) models. Diagnostics of interest include, but are not limited to, imaging of solids concentration, wall shear, local gas and solids velocities and concentrations (with up to 20% solids), gas and solids dispersion, turbulence, and granular temperature. These topics of interest are discussed in more below.

Gas-Solids Distribution: Advanced 3-dimensional imaging of gas-solids distribution is sought to measure voidages > 80% over a short time scales to help identify particle clusters. In order to avoid wall effects these measurements are desired in a circulating fluidized bed riser or transport reactor of 12" or larger in diameter with the ability to vary the axial location from the entrance, fully developed regions, and near the outlet of the riser.

Wall Shear Measurement: Shear at the wall of a circulating fluid bed riser is a critical boundary condition used by CFD codes for which sufficient information is not currently available. New, accurate approaches are sought to make these measurements on a local basis using Micro Electrical Mechanical Systems (MEMS) or optical interferometry with hair-like fibers, or similar technologies.

Data Analysis: Mathematical analysis methods are required to identify necessary and sufficient criteria for model validation using experimental results. Criteria and identification are required for local, micro-scale, gas-solids flow structures in circulating and transport fluid beds such as particle cluster size, concentration in order to compare and validate CFD simulations with experimental data. For example, further development is required for various de-convolution techniques such as wavelet analysis to separate cluster characteristics from diagnostic data from high speed pressure fluctuations, optical data, and gas tracer measurements.

Solids Circulation Rate: A method is needed to continuously monitor the circulation rate in the moving bed region of standpipes in hot circulating fluid bed reactors. Advanced power generation concepts such as chemical looping processes require the careful control of solids flow between three or more different fluid bed reactors operating at elevated temperatures. Currently there is no means to measure these solids flows.

Subtopic 2C. Dynamic Simulation and Advanced Process Control of Integrated Gasification Combined Cycle (IGCC) Plants (DE-PS26-07NT43114-02C)

Proposals are sought to develop advanced process control strategies for optimizing the operation and control of complex IGCC plants. Multiple components such as the air separation unit, gasifier, gas cleanup system, gas turbine, and steam cycle are integrated and require coordinated control to simultaneously satisfy operation and emission control objectives. Dynamic simulations are needed to determine the key equipment response time requirements and investigate interactions among those components so as to ensure safe, efficient, and environmentally friendly operation and control of the plant. The IGCC dynamic model needs to be used to predict the transient behavior of the IGCC plant during startup and shutdown, as well as subsequent to planned (e.g., loading, unloading) or unplanned (e.g., gasifier trip, gas turbine trip, steam turbine trip) disturbances of the steady-state operation. Advanced process control strategies needs to be designed to drive the gasifier to satisfy load demands while meeting IGCC plant integration, performance, and environmental objectives.

TECHNICAL TOPIC 3 – ADVANCED MATERIALS

New materials are required to significantly improve performance and reduce the costs of existing and/or advanced coal-based power systems. New materials are also needed to enable the development of new systems and capabilities for coal combustion, coal gasification, gas separations, hydrogen storage, high-temperature fuel cells, and advanced turbine systems. These materials are expected to perform satisfactorily under hostile conditions such as high temperatures, elevated pressures, pressure oscillations, corrosive environments (oxidizing or reducing conditions, gaseous

alkali, chloride or sulfur-containing species), surface coating or fouling, and high particulate loading. The following are of interest for the current announcement:

Subtopic 3A. Development of High Temperature Structural Materials (DE-PS26-07NT43114-03A)

The implementation of high-efficiency coal-fired power systems requires materials with high-temperature creep properties and high-temperature oxidation and corrosion resistance. For example, ultra-supercritical fossil fuel power plants will require new materials for use at temperatures of 700 °C and above. Superheater and reheater tubes are likely to experience the most severe service conditions with respect to fire-side corrosion, steam-side oxidation, and creep. A material for this application must not only be creep resistant, oxidation resistant, and corrosion resistant at elevated temperatures; but also be easily fabricated, easily joined, and economical. Materials with improved mechanical properties need to be developed to allow the operation of power generation plants using supercritical steam cycles with steam conditions approaching 700°C and 325 bar, and cycle efficiencies of about 48%. In the case of steam turbines, in addition to mechanical properties, oxidation studies to determine the temperature dependence of material loss and tendency for scale exfoliation need to be evaluated. A variety of modern tools, such as micro-structural modeling, segregation behavior modeling and plastic deformation simulation could be used to optimize the processing of these engineered materials and their microstructures.

Additionally, coatings need to be developed for corrosion resistance in oxidizing, sulfurizing, carburizing and water-containing environments. They are of particular interest for improving the corrosion resistance of alloys to achieve higher operating temperatures in fossil energy systems where sulfur and water vapor can cause severe oxidation problems. One of the factors that inhibit their application is a lack of sufficient data about their potential benefits in terms of lifetime and applicable environments. Model coatings need to be fabricated for corrosion testing and diffusion studies and develop a comprehensive lifetime evaluation approach.

Grant applications are requested to explore routes for the development of materials with temperature/strength capabilities beyond those currently available. The issues being addressed arise from the fact that (a) alloys with melting temperatures higher than current alloys have inherent mechanical property and environmental resistance deficiencies, (b) the potential of these materials can be exploited by application of mechanistic and thermochemical approaches, (c) exploitation requires compromises, e.g., ability to fabricate components, mechanical properties, and environmental sensitivity, (d) ceramics and ceramic composites have exceptional potential, but lack of understanding or databases of composition-structure-property relationships leads to need for extensive development, and (e) ceramics and refractories suffer rapid environmental degradation in some applications, which requires new approaches to develop increased corrosion resistance with good mechanical properties. The laboratory research could be accompanied by testing of the alloys under actual or simulated power plant conditions.

Subtopic 3B. Advanced Materials for Gas Turbine Coatings (DE-PS26-07NT43114-03B)

Gas or combustion turbines work at high temperature (over 1300°C) and need protective coatings for the components such as engine blades, vanes, and combustors that experience such high temperatures or come in contact with deleterious substances in the gas stream. The coatings, especially those based on ceramics, are broadly categorized as thermal barrier coatings (TBCs) and environmental barrier coatings (EBCs), depending on their primary function. Priorities in the program include the selection and verification testing of turbine hot path component materials and protective coatings when using coal-derived synthesis gas or hydrogen as fuel. Specifically, the thermal barrier functions of EBCs become vital for reducing the engine-component thermal loads and chemical reaction rates, thus maintaining the required mechanical properties and durability of these components. The improvement on the development of TBCs and EBCs will directly impact the successful development of advanced turbines.

Differences in synthesis gas composition relative to natural gas due to different gasifier type may also be researched with respect to the interaction of trace contaminants with advanced turbine blade materials and coatings. Synthesis gas contains traces of heavy metals not found in natural gas. The interactions of these trace constituents with the materials and coatings currently being used needs to be investigated. In addition, the presence of particulates may cause erosion or deposition, and gaseous species (e.g. SO_x, alkali compounds, HCl) may cause deposition and/or enhance corrosion. Synergistic effects between these degradation processes are also likely under gas turbine operating conditions. All these degradation modes rather than creep and fatigue processes may be limiting the operating life of turbine hot-gas components such as combustion chamber, vanes and blades when using coal-derived synthesis gas as fuel. Thus, hot corrosion and erosion-corrosion models to predict the lives of candidate materials in realistic environments for a gas turbine operating on coal-derived gases are necessary to assess potential lives of such components, and establish changes to these environments which would significantly extend these lives.

In the past, the designs for the coatings, especially TBCs for single crystal (SX) turbine blades, were developed through a phenomenological approach. However, today, emphasis is on prime-reliant design (i.e., providing the designer with safe performance criteria) based on sound mechanistic knowledge of gas-solid interactions at high temperatures, and of the way in which these interactions influence the processes involved in degradation during service. Grant applications are sought for high-temperature protective coatings for gas turbines using coal-derived synthesis gas along with a coherent strategy for their development. The aim is to identify the physically attainable limits and to push the operating envelope to that point through prime reliant design. Proposed approaches for the coatings should demonstrate their low thermal conductivity, adhesion, and survivability under operating conditions. Areas of interest include coatings for turbines based on both SX alloys and ceramics. For metallic substrates, separate coating layers may be required for the environmental and thermal barrier functions, whereas for ceramics, it may be possible to fulfill both roles in a single coating layer. Also of interest are manufacturing/coating processes that are airfoil-specific - e.g., coatings for vanes may be different than those for blades (different property/thickness requirements lead to different coating processes, etc.)

Subtopic 3C. Development of Functional Materials for Hydrogen Separation and Storage (DE-PS26-07NT43114-03C)

Functional, as distinguished from structural, materials are so designated because of properties that enable a process function to be performed, for example, membranes for gas separation and materials for hydrogen storage.

Gas separation may be effected through several types of mechanisms including solution-diffusion, molecular transport, and ionic transport. Gas separation has been identified as being critical for FutureGen technologies such as coal gasification and fuel cells, and includes hydrogen separation from reformed natural gas and synthesis gas from coal, and carbon dioxide separation from gas production and from the products of combustion of hydrocarbon fuels.

Advanced membrane technology offers opportunity for significant improvement over current separation techniques for production of hydrogen from coal. Reduction in cost, improved efficiency, and simplified systems are potentially possible with advancements in hydrogen membrane separation technologies. Grant applications are requested to develop novel membrane materials with high flux rates, structural strength, and low cost; the materials should lend themselves to defect-free manufacturing and perform effectively under conditions that exist at the gasifier exhaust or right after the gas clean-up step.

Another critical need is the development of materials for hydrogen storage as a necessary precursor to the eventual implementation of the hydrogen economy. For practical transportation applications,

the hydrogen storage material must function in the temperature range of 0-100°C and pressure range of 1-10 bar. The materials currently being investigated for hydrogen storage include metal organic frameworks; alloys and intermetallics; sodium and lithium alanates; nanocubes; carbon nanotubes; and other emerging materials. Research is needed to develop materials that provide high hydrogen storage density and stability at commercially relevant conditions of temperature and pressure. These materials should have the potential for achieving DOE's long-term hydrogen storage goals of 3 kWh/kg (9 wt%) at a cost of \$2/kWh. The materials to be investigated must be amenable to realistic processing and large-scale production.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding grants under this program announcement.

B. ESTIMATED FUNDING.

Approximately \$837,000 is expected to be available for new awards under this announcement.

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this announcement) \$ 200,000

Floor (i.e., the minimum amount for an individual award made under this announcement) \$ 80,000

D. EXPECTED NUMBER OF AWARDS.

DOE anticipates making approximately 4-6 awards under this announcement.

E. ANTICIPATED AWARD SIZE.

DOE anticipates that awards will be in the \$80,000 - \$200,000 range for the total project period.

F. PERIOD OF PERFORMANCE.

DOE anticipates making awards that will run from 12 to 36 months. Awards are limited to \$80,000 for a 1-year award, \$140,000 for a 2-year award, and \$200,000 for a 3-year award.

G. TYPE OF APPLICATION.

DOE will accept new applications under this announcement.

PART III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS.

In accordance with 10 CFR 600.6(b), eligibility for award is restricted to:

1. HBCU/OMI educational entities recognized by the Office of Civil Rights (OCR), U. S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities institution list (<http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>) in effect on the closing date of the program announcement.

2. Applications must be submitted through Grants.gov by a qualified HBCU/OMI authorized representative. Applicants must be an HBCU/OMI as defined above.
3. Applications from university-affiliated research institutions must be submitted through the college or university with which they are affiliated.
4. The Principal Investigator and Co-Principal Investigator(s)(if applicable) must be teaching professors at an HBCU/OMI and a minimum of 30% of personnel time involved under the grant is to pay for student assistance for each year of the grant.
5. The scope of work to be performed by subcontractors may not be more significant than the scope of work to be performed by the applicant.

National Laboratory Participation: A National Laboratory is not eligible for an award under this announcement, but may be proposed as a team member subject to the following: The scope of work to be performed by the National Laboratory (limited to 25% of award value) may not be more significant than the scope of work to be performed by the applicant.

Government Property: It is expected that no Government Furnished Property will be provided to awardees. However, it is expected that there will be Recipient Acquired Property as part of the grants.

B. COST SHARING.

Cost sharing is not required.

C. OTHER ELIGIBILITY REQUIREMENTS.

None.

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE.

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION.

1. Letter of Intent.

Letters of Intent are not required.

2. Pre-application.

Pre-applications are not required.

C. CONTENT AND FORM OF APPLICATION – SF 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL-Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. **Files that are attached to the forms must be in Adobe**

Portable Document Format (PDF) unless otherwise specified in this announcement.

1. SF 424 (R&R).

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the Applicant and Recipient Page at http://management.energy.gov/business_doe/business_forms.htm, under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information.

Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract(Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than Arial 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

Project Narrative(Field 7 on the Form)

The project narrative must not exceed 20 pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than Arial 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The project narrative must include:

Project Objectives: This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

Merit Review Criterion Discussion. The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V. A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE/NNSA WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.

Relevance and Outcomes/Impacts. This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.

Roles of Participants: For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

Facilities and Other Resources: Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project such as machine and electronics shops.

Equipment: List important items of equipment already available for this project and, if appropriate, not the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.

Bibliography and References, if applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part at any time. It is therefore required that it shall not contain proprietary or confidential business information.

Statement of Project Objectives (SOP): The Department of Energy's, National Energy Technology Laboratory uses a specific format for Statement of Project Objectives in its awards. In announcements such as this one, where the Government does not provide a Statement of Project Objectives, the Applicant is to provide one, which the DOE will then use to generate the Statement of Project Objectives to be included in the award.

Several specific tasks have also been provided in the following format for the Applicant to insert into the Statement of Project Objectives at the appropriate location.

The Statement of Project Objectives is generally less than 10 pages long and may be a separate file in addition to the project narrative. Applicants shall prepare the Statement of Project Objectives in the following format: **TITLE OF WORK TO BE PERFORMED:** (Insert the title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project. This section provides a brief summary of the planned approach to this project.

PHASE I - Task 1.0 - (Title)
Description)

Subtask 1.1 (Optional)
Description)

Task 2.0 - (Title)

PHASE II (Optional)

Task 3.0 - (Title)

D. CRITICAL PATH PROJECT MILESTONES (MILESTONE PLAN/STATUS)

As a part of the approved SOPO, the Recipient will develop a Milestone Plan that will serve as the baseline for tracking performance of the project and will identify critical path project milestones (no less than 2 per calendar year) for the entire project.

During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report as prescribed under Attachment 4, Reporting Requirements Checklist. The Milestone Status will present actual performance in comparison with Milestone Plan, and include:

- (1) the actual status and progress of the project;
- (2) specific progress made toward achieving the project's critical path milestones, and;
- (3) any proposed changes in the projects schedule required to complete critical path milestones.

E. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

F. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the Project Officer at the Project Officer's facility located in Pittsburgh, PA or Morgantown, WV.

Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort annually.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV.
Project Performance Site: Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.
Biographical Sketch Appendix:

Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file. The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with Arial font not smaller than 11 point and must include:

Education and Training:

Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.

Research and Professional Experience:

Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications.

Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities.

List no more than 5 professional and scholarly activities related to the effort proposed.

Current and Pending Support Appendix.

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator(s) (PD/PI) and senior/key persons, including subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. The Current and Pending Support Appendix will not count in the project narrative page limitation. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the "Attach Current and Pending Support" field in each profile.

Bibliography & References Cited Appendix

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Facilities & Other Resources Appendix

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Equipment Appendix

List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. This appendix will not count in the project narrative page limitation.

Do not attach files for fields 8, 9, and 10, instead follow the above instructions to include the information as appendices to the project narrative file.

Other Attachment Appendix (Field 11 on the form)

If you need to elaborate on your responses to questions 1-5 on the "Other Project Information" document, provide the information in a single file named "projinfo.pdf". Click on "Add Attachments in Field 11" to attach file.

Also, attach the following files:

Environmental Questionnaire

You must complete the environmental questionnaire at <http://www.netl.doe.gov/business/forms/451> 1-3.doc. Save the questionnaire in a single file named "Env.pdf" and click on "Add Attachments" in Field 11 to attach.

Project Management Plan

This plan should identify the activities/tasks to be performed, a time schedule for the accomplishment of the activities/tasks, the spending plan associated with the activities/tasks, and the expected dates for the release of outcomes. Applicants may use their own project management system to provide this information. This plan should identify any decision points and go/no-go decision criteria. Successful applicants must use this plan to report schedule and budget variances. Save this plan in a single file named "pmp.pdf" and click on "Add Attachments" in Field 11 to attach.

3. R&R Senior/Key Person N/A

4. RESEARCH AND RELATED BUDGET Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; material and

supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. You must have a letter from each third party contributing cost sharing (i.e., a party other than the organization submitting the application) stating that the third party is committed to providing a specific minimum dollar amount of cost sharing. In the budget justification, identify the following information for each third party contributing cost sharing: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing – cash, services, or property. By submitting your application, you are providing assurance that you have signed letters of commitment. Successful applicants will be required to submit these signed letters of commitments. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

5. R&R SUBAWARD BUDGET ATTACHMENT(S) FORM

Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT (S) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name as the file name.

6. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Summary of Required Forms/Files

Your application must include the forms from the application package and other documents as shown below:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
Research & Related Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
Biographical Sketch	PDF	Field 7
Current and Pending Support	PDF	Field 7
Environmental Questionnaire	PDF	Field 11
Project Management Plan	PDF	Field 11
Research & Related Budget	Form	N/A
Budget Justification	PDF	Field K
R&R Subaward Budget	Form	N/A
SF-LLL Disclosure of Lobbying Activities, if applicable.	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS.

If selected for award, DOE reserves the right to request additional or clarifying information for

any reason deemed necessary, including, but not limited to:

- a. Indirect cost information
- b. Other budget information
- c. Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- d. Representation of Limited Rights Data and Restricted Software, if applicable
- e. Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable
- f. Environmental Questionnaire. You must complete and submit an environmental questionnaire. This form is available at: <http://www.netl.doe.gov/business/forms/451> 1-1-3.doc

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date.

Pre-applications are not required.

2. Application Due Date.

Applications should be received by 06/12/2007, 8:00:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS.

Cost Principles. Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit.

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD. Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an e-mail to support@grants.gov.

2. Registration Process.

You must COMPLETE the one-time registration process (all steps) before you may submit your first application through Grants.gov (See www.grants.gov/GetStarted. **We recommend that you start this**

process at least three weeks before the application due date. It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process.

IMPORTANT: During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner identification Number” (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

3. Application Receipt Notices.

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the e-mails. It may take up to two (2) business days from application submission to receipt of e-mail Number 2. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (e-mail Number 1) to track a submission. The titles of the five e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 - DOE e-Center Grant Application Received

The last e-mail will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last e-mail changes to:

Number 5 - DOE e-Center Grant Application Received and Matched

This e-mail will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria.

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria.

Applications submitted in response to this funding opportunity will be evaluated and scored in accordance with the weights listed below:

CRITERION 1 – SCIENTIFIC AND TECHNICAL MERIT – 45%

- The research presents a significant contribution to expanding the base of knowledge in the defined focus area.
- Innovative approaches and solutions are proposed with routine data collection using proven techniques specifically discouraged.
- An awareness of the state-of-the-art in related areas of coal research is demonstrated.

CRITERION 2 –STATE OBJECTIVES AND THE PROBABILITY OF ACHIEVING THEM –

40%

- Clearly addresses a problem, concept or question described within the focus area.
- A well-defined, logical statement of work is provided to effectively address the technical issues.
- An approach is described that is scientifically sound, well planned, and current methods are used in the investigation

CRITERION 3 – TECHNICAL AND MANAGEMENT CAPABILITIES – 10%

- Demonstrated capability and experience of the applicant and its participating organizations in managing projects that meet project objectives, within budget and on schedule.
- Clarity, logic and effectiveness of project organizations, including subawardees, to successfully complete the project.
- Credentials, capabilities and experience of key personnel.

CRITERION 4 – FACILITIES AND EQUIPMENT –5%

- Adequacy and availability of proposed personnel, facilities and equipment to perform the project tasks.

3. Other Selection Factors.

OTHER SELECTION FACTORS.

These factors, while not indicators of the application's merit, e.g., technical excellence, cost, applicant's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Selection Official to assist in determining which of the ranked application(s) shall receive DOE funding support.

1. It is desirable to select for award a group of projects which represents a diversity of technical approaches and methods;
2. It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives;
3. It is desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of different technical perspectives;
4. It is desirable, because of the nature of the energy source, the type of projects envisioned, or limitations of past efforts, to select for award a group of projects with a broad or specific geographic distribution.

The above factors will be independently considered by the Selection Official in determining the optimum mix of applications that will be selected for support. These policy factors will provide the Selection Official with capability of developing, from the competitive funding opportunity, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review.

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance and Unsolicited Proposals." This guide is available under Financial Assistance, Regulations and Guidance at <http://management.energy.gov/documents/meritrev.pdf>.

2. Selection.

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award.

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award;

(3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

DOE anticipates notifying applicants selected for award by 09/30/2007 and making awards by 01/18/2008.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

1. Notice of Selection.

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

2. Notice of Award.

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. Applicable program regulations, if any; 3. Application as approved by DOE.; 4. DOE assistance regulations at 10 CFR part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; 5. National Policy Assurances To Be Incorporated As Award Terms; 6. Budget Summary; and 7. Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

1. Administrative Requirements.

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: <http://ecfr.gpoaccess.gov>), except for grants made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements.

Special Terms and Conditions and National Policy Requirements.

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at

http://management.energy.gov/business_doe/business_forms.htm. The National Policy Assurances To Be Incorporated As Award Terms are located at http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions.

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/techtrans/sipp_matrix.html.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. See <http://www.netl.doe.gov/business/forms/FederalAssistanceReportingChecklistExample> for the proposed Checklist for this program.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the "Submit Question" feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the "Submit Question" button. Enter required information. You will receive an electronic notification that your question has been answered. DOE will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

Questions regarding program requirements must be directed to:
IIPS

B. Agency Contact

Name: Robyn McKee

E-mail address: Robyn.McKee@netl.doe.gov

Fax: 412-386-6137

Telephone: 412-386-6001

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an e-mail when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS.

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION.

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the

following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL.

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER. N/A

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

APPENDICES/REFERENCE MATERIAL REFERENCE MATERIAL